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ABSTRACT

The activities in this publication are taken from one of the thirteen units comprising the "Environment and the Quality of Life" series in New Jersey. This book is one of three containing energy-related student activities at various grade levels. The topic of this particular book is energy transportation. The activities correspond to a number of behavioral objectives and are further grouped according to suitability for pupils in grades K-8. Interdisciplinary in approach, the activities are taken from the subjects of science, art, social studies, mathematics, language arts, English, manual arts, health, and guidance. The book contains some charts and illustrations, as well as a listing of supplementary references. (MA)

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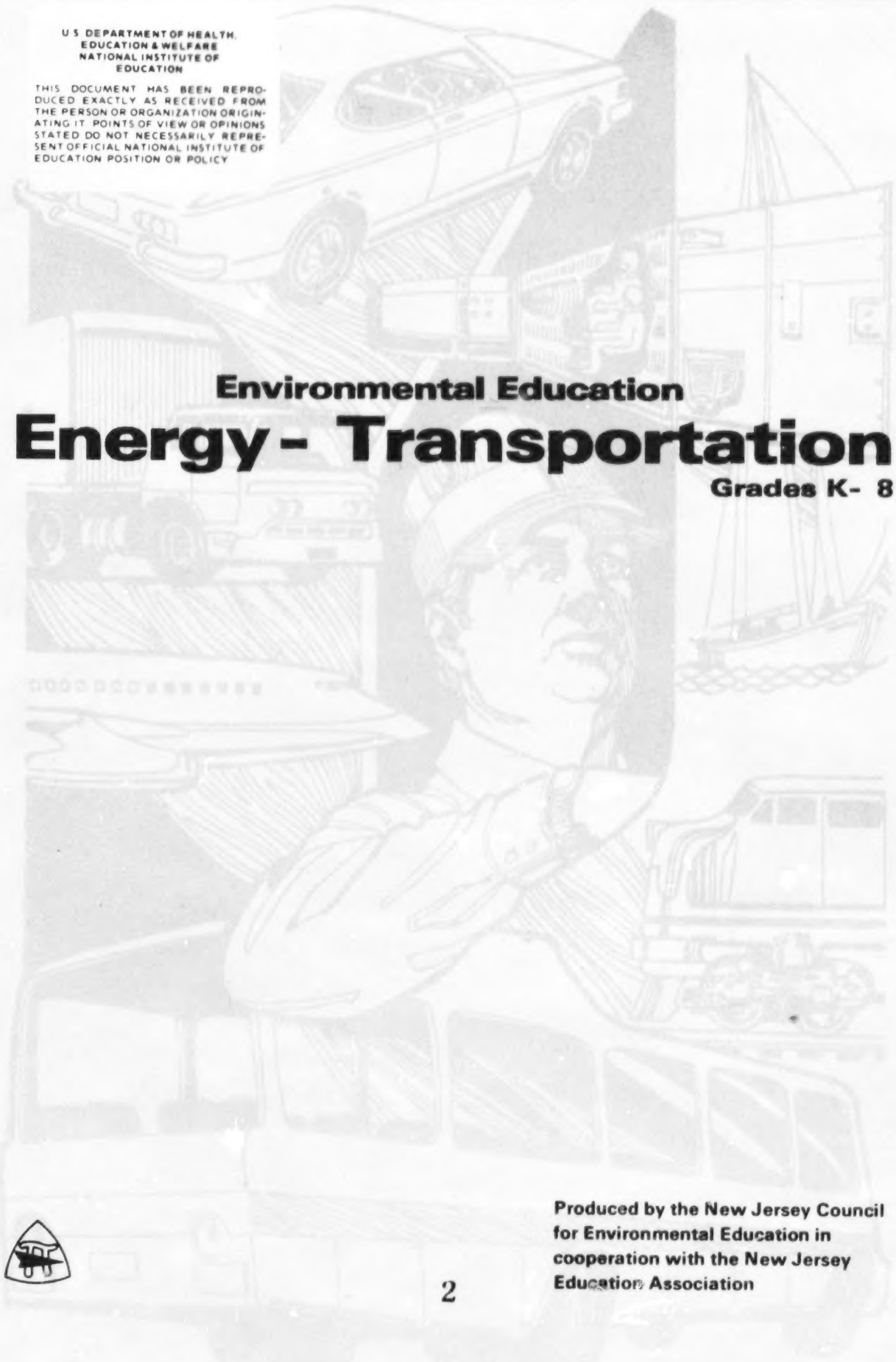

Environmental Education

Energy - Transportation

Grades K- 8

Produced by the New Jersey Council for Environmental Education in cooperation with the New Jersey Education Association

SE020 263

ENVIRONMENTAL EDUCATION

ENERGY - TRANSPORTATION

Grades K - 8

Prepared by

THE NEW JERSEY STATE COUNCIL FOR ENVIRONMENTAL EDUCATION
at Montclair State College
Upper Montclair, New Jersey
07043

Dr. Edward J. Ambry, Director

In Cooperation With

THE NEW JERSEY EDUCATION ASSOCIATION

Pursuant to

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The project reported herein was performed pursuant to a grant from the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education and no official endorsement by the U.S. Office of Education should be inferred.

ENERGY - TRANSPORTATION

INTRODUCTION

The activities in this book have been selected from a Computer Based Resource Unit entitled, "Energy - Transportation". It is one of thirteen units in the "Environment and the Quality of Life" series produced by the New Jersey State Council for Environmental Education, a federally funded project under Title III, Sec. 306 Elementary and Secondary Education Act, directed by Dr. Edward J. Ambry at Montclair State College, Upper Montclair, New Jersey.

Mr. William G. Harding, Curriculum Specialist on the Council staff, coordinated the production of "Energy - Transportation" under the direction of Edna Doll, Assistant Director in Charge of Curriculum.

All the activities are related to learner objectives and are grouped for pupils at various grade levels. Not all objectives have activities for all grade levels. Teachers may adapt, adopt, correlate, separate or use these activities in a variety of ways which they determine will meet the needs of their students. Activities may be used with large groups, small groups or for individual instruction.

Also available at this time are two similar books containing student activities, entitled, "Energy - Society" (grades 4-12) and "Energy - Technology" (grades 7-12). For information, write to the New Jersey State Council for Environmental Education, Montclair State College, Upper Montclair, New Jersey 07043.

Teachers desiring more complete information on these subjects may request Computer Based Resource Units. CBRU's include activities, content items which serve as background information for teachers and/or students, measuring devices, and lists of books, pamphlets, articles and multimedia materials, all related to specific learner objectives. CBRU's are available to all New Jersey teachers through the combined efforts of the New Jersey State Council for Environmental Education and the State Department of Education. Refer to the CBRU Resource Manual located in each school and fill out the required CBRU Request Form.

Thirteen Environmental Education CBRU's have been developed by the Council with the aid of consultants and specialists in Environmental Education, and Curriculum Development Teams, composed of teachers from all grade levels, teaching in urban, suburban, and rural districts, representing all sections of New Jersey. It is the desire of the curriculum developers that these units provide for exciting and relevant learning experiences for students. They embody educational materials which allow teachers a wide selection of alternatives for classroom use and for individualized approaches to the needs of pupils in elementary and secondary instructional programs.

ACKNOWLEDGEMENTS

We wish to thank members of the Council who aided in the production of this book: Marie Gostin, Arthur Thornton and Lorraine Wirths.

Art work by Deborah Healy, free-lance artist.

ENERGY - TRANSPORTATION

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OBJECTIVE: To identify objects in our homes used in transporting things.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3

SUBJECT: Language Arts, Art

ACTIVITY:

1. We transport "things" as well as people in our daily lives - can you list some everyday devices we use at home to move "things" from one place to another. For example:

   a) Wheelbarrow
   b) Wash Basket
   c) Pocketbook

   Draw pictures of these devices and arrange them on the bulletin board.

GRADE LEVEL: 2, 3, 4, 5, 6

SUBJECT: Art, Language Arts, Science

ACTIVITY:

1. Draw a diagram of a house showing an arrangement for several types of pipes used in homes. Describe at least 3 functions served by the pipes.

GRADE LEVEL: 4, 5, 6

SUBJECT: Language Arts, Social Studies, Science

ACTIVITY:

1. Discuss the importance of pipelines in our daily lives.

   A. How does water get from the basement to the kitchen and bathrooms?
   B. How does gas get to your home?
   C. Where does oil come from? How do we get it at home?
   D. Can pipelines be considered a type of transportation?

SUBJECT: Language Arts

ACTIVITY:

1. Make a crossword puzzle which has questions relating to objects we use for transporting things. For example:

   Across
   1. What does mom carry her wash in? (Basket)
   7. You can find dad's wallet in his _____ (Pocket)

   Down
   1. What is a two-wheeled vehicle you might ride in your yard? (Bicycle)
   2. You can carry some objects in your _____. (Arms)
   3. Dirt is often carried in a _____. (Shovel)
   4. An object used to start your car is a ____. (Key)

2. Tell a story about how a member of your family transports other people or objects around your house. The story should incorporate the notion of movement of objects. Make it a funny story.

GRADE LEVEL: 6, 7, 8

SUBJECT: Language Arts, Science

ACTIVITY: 1. Define transportation as it occurs in the home. (The definition should include the concept of movement of people or objects from one place to another with the aid of a man-made device.

OBJECTIVE: To identify people who help transport other people and things.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3

SUBJECT: Language Arts, Physical Education

ACTIVITY:
1. Play a guessing game with your class. Pantomime various jobs connected with transportation - bus driver, pilot, train conductor, fireman, truck driver, helicopter weatherman, ice cream man, mailman, taxi driver, etc.

GRADE LEVEL: 2, 3, 4

SUBJECT: Art, Science, Language Arts

ACTIVITY:
1. Fold a paper in quarters. Draw four pictures which show how one of your favorite foods reaches your home. At least three steps in the transportation process should be illustrated, including the people responsible.

SUBJECT: Art, Social Studies, Science

ACTIVITY:
1. Cut pictures out of old magazines to form a collage of as many methods of transportation as possible. Include pictures of the people who run the machinery and make it all possible.

SUBJECT: Language Arts, Social Studies, Art

ACTIVITY:
1. Correctly identify some members of your community who work in the field of transportation. Explain what each one does. Draw a picture of each one.

GRADE LEVEL: 3, 4, 5, 6, 7, 8

SUBJECT: English, Social Studies

ACTIVITY:
1. Borrow books about transportation from your local or school library. Set up a display table in your classroom for community use by class members.

GRADE LEVEL: 4, 5, 6,

SUBJECT: English, Social Studies

ACTIVITY:
1. "Neither snow nor rain nor gloom of night shall stay this messenger from the swift completion of his appointed rounds." What does this famous quotation say about the dedication of a postman? Why is such dedication important? Write your own quotation expressing your sentiments about the importance of a transportation system.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Social Studies, Career Education

ACTIVITY:

1. Invite members of the community who have jobs in public transportation to come and speak to the class about their jobs. (Suggestions - bus driver, taxi driver, pilot, truck driver, conductor, engineer.) Prepare a list of questions before they arrive. Some good questions might be - What do you do all day? How long is your day? What is the part of your job which you think is fun? What are the difficult things about the job? How could I prepare for a job like yours?

GRADE LEVEL: 6, 7, 8

SUBJECT: Language Arts, English

ACTIVITY:

1. Read one or more of the following poems - "Southbound on the Freeway", by May Swenson; "Crossing", by Phillip Booth (in 'Reflections on a Gift of Watermelon Pickle', Stephen Dunning et al, Lothrop, Lee and Shepard Co., Inc. New York, 1967, pp. 82 and 43); "The Old Ships" by James Elroy Flecker, or "Adlestrop", by Edward Thomas (in 'Here and There', Elinor Parker, Thomas Crowell Co., New York 1967, pp. 95 and 127). Identify the type of transportation the poem describes. Who is having the experience? Think of an experience you have had in a train, bus, car, etc. Recreate with a picture, poem or story the feeling you had.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies, English, Career Education

ACTIVITY:

1. Describe some careers in the transportation industry. Include:
    a. Training needed
    b. What the job entails (i.e., its responsibilities)
    c. Good and bad aspects of the job

SUBJECT: Social Studies, Career Education

ACTIVITY:

1. Research the import-export business. How are products transported in and out of a country? What careers are related to this field? What type of special packaging might be required? Is there a problem with the shipment of foods because of spoilage? What laws exist to protect against the entry of harmful plants and animals into the United States?

OBJECTIVE: To identify alternative modes of transportation.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 1, 2, 3

SUBJECT: Art, Language Arts, Social Studies

ACTIVITY:

1. Cover one wall with a giant yellow school bus. Draw your picture and place it in a window of the bus. Answer the following - do you ride the school bus to school? Count the seats on your school bus. How many children does it hold? What are some good rules to obey on the bus? If you didn't use the bus, how could you get to school?

SUBJECT: Art

ACTIVITY:

1. Glue pictures of various kinds of transportation on cardboard. Cut up the cardboard sheets into several pieces thereby creating a puzzle that needs to be put back together. Keep each puzzle in a separate envelope so that other class members may use them in their spare time.

GRADE LEVEL: 2, 3, 4

SUBJECT: Art, Social Studies, Language Arts

ACTIVITY:

1. Create a mammoth transportation booklet on large oaktag sheets. (Each student should have one page on which to work.) Cut out a picture or draw one depicting a mode of transportation that interests you. An explanation should be written beneath the picture. Such a project might make a tour of various classrooms or be placed on display in a central place so everyone could look at his/her leisure.

GRADE LEVEL: 4, 5, 6

SUBJECT: Social Studies, Art

ACTIVITY:

1. Develop a transportation bulletin board. The title could be, "Did You Know?"

   A. A cement mixer does two things at one. (Mixes sand, gravel and water into cement and transports it.)
   B. Cars ride piggyback. (Show a car trailer that carries cars to dealers.)
   C. Some mail is sorted on a train. (Show mail sorted in a mail car.)
   D. Milk trucks have manholes. (Show one of those large milk trucks used from dairy)
   E. Etc.

GRADE LEVEL: 4, 5, 6, 7

SUBJECT: Social Studies

ACTIVITY: 1. Create a diorama, using a shoe box, to illustrate a mode of transportation used by the Ancient Greeks, Romans, Egyptians, American Indians, etc. What was the environmental impact of this transportation? Could some form of this transportation mode be applied to this day and age?

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Social Studies, Science

ACTIVITY: 1. There are no cars in Disneyland. How do people get about? Research the transportation methods used there. Do they lend themselves to wider use? Why or why not?

SUBJECT: Social Studies, Science, English

ACTIVITY: 1. In the Newark Airport Terminal there is a moving sidewalk used to move large crowds of people. In England there is a moving sidewalk called a "travolator" in the bank station of the London underground. Research the idea of moving sidewalks. Determine whether or not such an idea would be effective in your town. Write a composition on what it would be like if all the sidewalks in your town were moving. What are the advantages and disadvantages of this idea?

SUBJECT: Art, Language Arts, Social Studies, Science

ACTIVITY: 1. Create a diorama, using a shoe box, to illustrate the means of transportation which interests you most. (Outmoded means of transportation might be included.) Write an explanation of why you elected this mode of transportation. What is the environmental impact of this means of transportation?

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies, Science, English

ACTIVITY: 1. Even in the 1900's streets in New York City were congested with traffic because they were too narrow. The solution then was to build elevated trains which traveled above the city streets. Write and deliver a speech defending an electric monorail which would travel above the city streets.

SUBJECT: Social Studies, English

ACTIVITY: 1. Obtain timetables of the Erie Lackawanna Railway, the Jersey Central Railroad, a major airline and a major ship company. After learning to read the tables, plan a

trip to a faraway place you have always wanted to visit. Plan your leaving time, connections you would have to make, arrival time, etc.

2. Plan a trip to London from your house using alternate means of transportation. For example, you could travel from your home to New York City by car, bus, train or even airplane. You could get to England by ship or by airplane. Use time schedules and travel agency brochures to determine how long your trip would take using different types of transportation. What would be the most expensive way to travel? What would be the cheapest? Describe the accommodations for each type of trip.

SUBJECT: History, English

ACTIVITY:

1. Write a "newspaper" account depicting the activity when the "Golden Spike" was driven joining the eastern and western parts of the transcontinental railroad. Include interviews with a politician, an Indian, a buffalo hunter, a railroad engineer, a Chinese laborer and an owner of the railroad.

SUBJECT: Social Studies, Mathematics, English, Art

ACTIVITY:

1. On a map, plot a trip from one city to another or one state to another and decide how you would get there. (You may need to call a train station or bus terminal). Figure the cost of the trip. If you plan to use a car, compute the miles per gallon and the cost per gallon of gasoline, plus tolls and other fees. What is the mileage you intend to cover?

2. Plan a vacation trip to another state. How would you get there if you couldn't use your car? Would you go by train, bus, plane or boat? Find out the actual cost of two ways of going, then select the one you would prefer. Consider such items as baggage you would need, time it would take, etc. Also, how would you get from the train station or air field to your camp or hotel? Make a complete report of your trip. Include a map which you have drawn, plus your calculations.

SUBJECT: Social Studies

ACTIVITY:

1. Some towns in New England and some college campus areas have bicycle systems. The town has 50 or 100 bicycles left in strategic places. If you need to go from a parking lot to the Post Office, you take an available bike, use it and then leave it for the next person. Town bikes are colorfully indicated. What are the advantages of such a system? Would it work in your town? Why or why not?

GRADE LEVEL: 7, 8

SUBJECT: English

ACTIVITY:

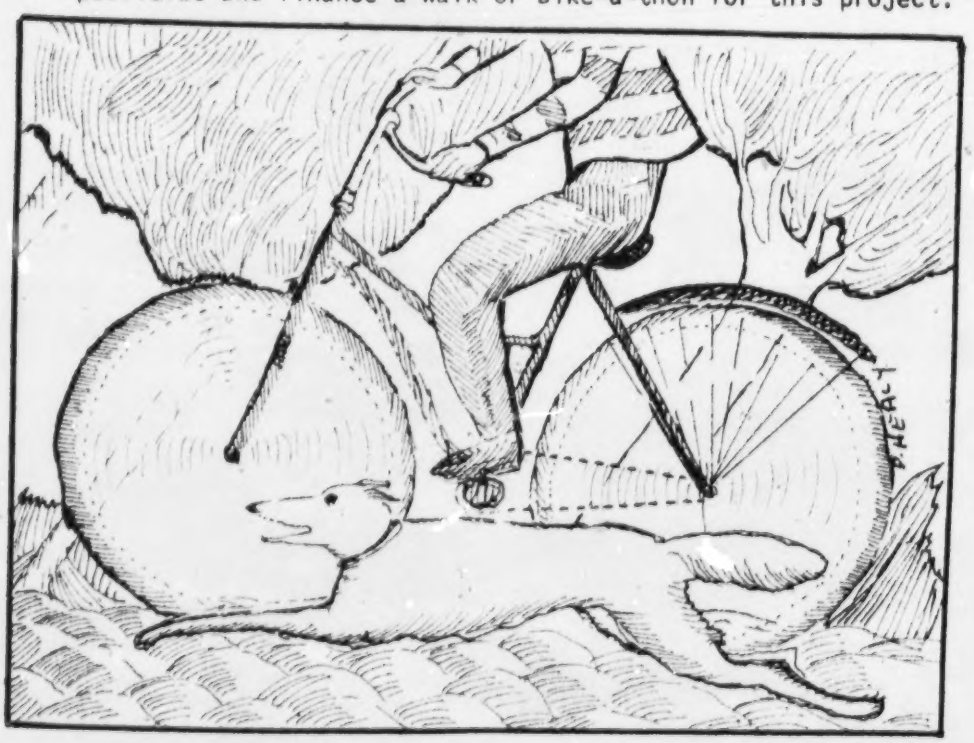
1. Read Robert Frost's "Stopping by Woods on a Snowy Evening". How has the author gotten around? Compare his mode of transportation to car travel. What is the difference in tempo - mood - things felt and expressed? Try to write something of your own evoking a mood corresponding to a mode of travel.

2. Read the poem "You Are on U. S. 40 Headed West" by Vera White (America Forever New, Sara & John E. Brewton, Thomas Crowell Co., Pub., New York 1968, p. 234). This road was dreamed of by Thomas Jefferson. Look up the road on a map. How does the poem make you feel? Write a poem about a long trip you have taken. Don't worry about words that rhyme. Work for the feeling you had.

SUBJECT: Social Studies

ACTIVITY:

1. Investigate and plan the possibility of instituting a bike route through your town. Identify where it would be by surveying several possible areas. Decide, after studying the traffic patterns, what hours would be safest to use the route. Plan how the area should be marked, protected, and the rules to be enforced for its use. If possible, present the plan to the mayor. Contact the JayCee's to publicize and finance a walk or bike-a-thon for this project.



OBJECTIVE: To analyze the transportation needs of a local community.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3

SUBJECT: Art, Language Arts, Social Studies

ACTIVITY:

1. Using modeling clay, create images showing how you and other members of your family commute around your town. Do you walk, ride a bike, car, bus, etc.? Is there a best way? Why or why not?

GRADE LEVEL: 4, 5, 6

SUBJECT: Safety, Health

ACTIVITY:

1. Organize a "Parade for Safety" at your school. Get youngsters to bring their bicycles to school and decorate them. Have a policeman or crossing guard come and talk about bicycle safety. Culminate the activity by a ride around the school grounds.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Health, Safety, Social Studies, Art

ACTIVITY:

1. There is always a need for safety in transportation. Organize a bicycle safety club in your school. Some activities for your club would be - make badges for each member - make patterns from paper and paint them with fluorescent colors to protect bike riders, and pin them to club members' jackets - invite the owner of a bicycle repair shop to speak to your club about bicycle maintenance - invite a policeman to your classroom to discuss bicycle safety and to suggest additional activities.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Manual Arts, English, Social Studies

ACTIVITY:

1. Is there an alternate way of meeting people's needs or getting from one place to another? We seem to think only of new roads. Devise another way of travel to meet the needs of the people in your community.

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies, Language Arts

ACTIVITY:

1. In Atlantic City, New Jersey, there is a fleet of "jitneys". These are small buses holding 12 or 15 people. The jitneys

run frequently and are inexpensive to ride. Investigate the possibility of jitneys for your city or town. Compare them to standard size buses. Write a paper on this topic when you have finished your research and discussion.

SUBJECT: Social Studies, Mathematics

ACTIVITY: 1. Draw a square on a piece of paper and divide it into four equal parts. Label one part commercial, one part industrial, one part residential and one part business. Draw an arrow between zones to represent: (a) Monday morning traffic, (b) Friday evening traffic, and (c) Wednesday afternoon (1 p.m.) traffic, and any other times which seem significant to you. Explain the arrow action. If problems exist, suggest some solutions.

SUBJECT: Social Studies

ACTIVITY: 1. Develop a questionnaire to determine facts, opinions and attitudes about transportation systems available in your community. The instrument might include such questions as: How do you get to work? If you travel by car, how many people go with you? What route do you travel? What problems do you see with present mass transit systems? Would you use these systems if the problems were corrected? How many miles do you travel with your car each year - in your county - outside of your county? Identify a target audience (e.g., the parents of the students in your class) and have them complete the questionnaire. Names and addresses are not necessary. Summarize the data and draw conclusions about present transportation facilities in your community.

SUBJECT: Social Studies, Art

ACTIVITY: 1. Construct a model of a given area of the community. Include in the model the existing residential, industrial and recreational areas. Mark roadways, airports, and railroads. All parts of the model should be moveable. The model can be used to demonstrate existing problems of traffic jams or areas of heavy pollution. Also, the model can be used to work out improvements and changes.

SUBJECT: English

ACTIVITY: 1. Write a paragraph about an imaginary or actual trip on a ship, plane or train and correctly use such terminology as arrival time, departure time, estimated time of arrival and time in transit.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Is there a road overseer in your community? Find out what his major responsibilities are and ask him questions relating to the needs of your community as far as transportation is concerned. Some sample questions might be - What is the difference between local, county, state and national roads? Who pays for the roads? What is your community's budget for road work? What does this entail? Are new roads being contemplated? If so why? etc.

2. Get a state map from your local gas station. Study the main highways on the map. Make note of those cities which have the best road connections. Also, make note of those cities lacking good connections. Make imaginative suggestions as to how transportation could be improved. Are roads the only answer?

SUBJECT: English, Social Studies

ACTIVITY:

1. From your local paper, clip as many articles which have to do with transportation as possible. Tack them to the bulletin board. What problems emerge as you study the clippings? Can you suggest any remedies? If they are good ones, you might try having them put into use.

SUBJECT: Science, Social Studies

ACTIVITY:

1. Investigate how we get liquids from one place to another. Do a paper or give an oral report to the class on this subject. Consider moving such liquids as hot oil, liquified gas, water and sewage. What different problems do they present? Consider moving these substances to and from your hometown. For instance, would you use different methods to get oil from the Middle East, Pennsylvania or Texas; or to get sewage from your home to the sewage treatment plant or to the offshore dump.

SUBJECT: Career Education, Language Arts, Social Studies, Mathematics

ACTIVITY:

1. Obtain a copy of a local newspaper and turn to the classified section. Identify those jobs which are directly related to transportation. Calculate the percentage of jobs which fit into this category.

SUBJECT: Mathematics

ACTIVITY:

1. Construct a bar graph which shows the relative safety of different types of transportation. Which is the safest way to travel? The least safe? Discuss with your class.

OBJECTIVE: To analyze the transportation patterns of a local community.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Social Studies, Art, Science, Language Arts

ACTIVITY:
1. Create a map that would direct someone from your school to your home by two different routes, using two different forms of transportation. (E.g., car, bike, bus, boat, horseback, roller skates, walking, subway, etc.)

GRADE LEVEL: 4, 5, 6

SUBJECT: Art, Social Studies

ACTIVITY:
1. Draw a map of your community. Accurately outline the residential, business, commercial and industrial areas and the major thoroughfares which serve these districts.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies, Art

ACTIVITY:
1. Using a service station road map, identify the different types of roads which pass through your state, county and town. Make up a map of an imaginary area. Use as many different kinds of roads as you can. You could have great fun making up names of towns.

SUBJECT: Social Studies, Science, Music, English

ACTIVITY:
1. Discuss the advantages and disadvantages to early societies of living near water. Why did men continue to build their cities near water after the invention of the wheel? In view of the increasing levels of water pollution, do you suppose that it will be more or less advantageous to live near lakes and rivers in the future? Write a poem, ballad or song about living near a river, lake or the ocean.

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies, Science, English

ACTIVITY:
1. William Penn's plan for Philadelphia called for streets 50 feet wide. For today's cars, trucks, and buses, the streets are too narrow. Philadelphia has started to solve this problem by building new expressways which travel across town. Pretend you are a city planner. Design a plan which would describe other ways of solving this problem.

SUBJECT: Mathematics, Social Studies

ACTIVITY:
1. Conduct a survey to determine the extent and nature of family use of the automobile for one week by the families represented by the students in your class. Compile all the figures into a large graph. You might use such headings as business, shopping, taking kids to school, attending meetings, recreation, etc. What can be done to save energy and still meet people's needs?

SUBJECT: Social Studies, Art, English, Science

ACTIVITY:
1. Design a transportation network for the following land unit: A country which is square in shape with a perimeter of 1000 miles. A mountain range, 15,000 feet high, runs north and south through the center of the country. Six rivers flow from the mountains to the borders (three flow east and three flow west). The rivers and the mountains divide the country into six approximately equal states. There is one major city in each state. Consider the types of transportation necessary to carry goods and people from one city to all of the others. Also consider the environmental impact of these facilities. Attempt to develop the most pollution-free network.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Analyze the direction of traffic flow between zones (residential, commercial, industrial, educational) in your community. Consider the activity to be concentrated about a point in the center of the zone. Identify this central point on a map and draw arrows from point to point to depict general traffic flow between zones for weekday and weekends and for various times of the day. Summarize the apparent patterns. What facilities exist within your community to handle this traffic?

SUBJECT: Social Studies, English

ACTIVITY:
1. After classroom discussion, write a master transportation plan for your community. You will have to consider present problems and future trends. Include maps, diagrams, photographs. Individuals or small groups might work on this project.

SUBJECT: Social Studies, Mathematics

ACTIVITY:
1. Consult the "industrial directory" for your state at your local library to determine the percentage of local industries which are directly involved in transportation. Arrange your findings in a graph or use some other pictorial way so that the figures can be explained to the class.

OBJECTIVE: To identify transport system characteristics.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 1, 2, 3, 4

SUBJECT: Art, Social Studies

ACTIVITY: 1. Create a collage with magazine pictures depicting the various modes of transportation in our country.

SUBJECT: Social Studies

ACTIVITY: 1. Using a road map, identify various kinds of roads such as turnpikes, primary and secondary roads. Look for other items such as the names of rivers and mountains, indicators of bridges and ferries, etc.

GRADE LEVEL: 2, 3

SUBJECT: Language Arts, Art, Social Studies

ACTIVITY: 1. Cut out pictures or draw a picture that identifies the parts of one transportation system (e.g., airport, plane, ticket counter, pilot, stewardess). Explain your picture.

SUBJECT: Art, Social Studies, Language Arts, Safety, Health

ACTIVITY: 1. Create a large mural of the interior of a train, bus, plane, etc. Place chairs in front of the mural depicting the seats on the vehicle. The mural will be helpful for role playing various transportation situations.

GRADE LEVEL: 2, 3, 4, 5,

SUBJECT: Language Arts, Social Studies

ACTIVITY: 1. Plan a field trip to a train station. Be sure to include visits to the ticket counter, the passenger loading area, the freight loading area, etc. Note the amount of space necessary for a train station. Observe noise and air pollution. Interview a conductor, a ticket salesman and an engineer, if possible. Think up questions before you go.

GRADE LEVEL: 4, 5, 6

SUBJECT: Social Studies, Science

ACTIVITY: 1. Research the methods used by the Ancient Egyptians to move large objects. They had no machines as we know them, but used inclined planes and levers. Demonstrate these techniques to the class.

SUBJECT: Social Studies, Art

ACTIVITY: 1. On the blackboard, list as many transportation systems as possible. Under each, list its characteristics. Choose one to illustrate.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Social Studies

ACTIVITY: 1. List some characteristics which are common to all transport systems.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Science

ACTIVITY: 1. Demonstrate the principle of jet propulsion by attaching a balloon to a paper airplane with glue and showing the increased distance the plane can fly. Add weight to the plane by attaching paper clips. Determine the amount of weight which must be added to reduce the flight of the plane to the distance it travels with the balloon attached but not inflated. This weight provides a measure of the thrust of the "jet engine".

SUBJECT: Social Studies, Mathematics

ACTIVITY: 1. Obtain a road map of your state from a local service station. Locate several towns and calculate distances between them. For example, in New Jersey, locate the following towns: Absecon, Long Valley, Sun Ray Beach, Deal, Hi-Nella, Appelgarth, Convent Station and Union Beach. Plan a trip between Convent Station and Absecon. What routes would you take? How far is it between these two towns? List the streams and rivers you cross on the way. Also list the scenic points of view which you pass.

GRADE LEVEL: 6, 7, 8

SUBJECT: English

ACTIVITY: 1. Look up a book called "America Forever New, A Book of Poems" compiled by Sara & John Brewton and published by Thomas Y. Crowell Co. There are many fine poems in this book. It also contains a section titled "Americans Are Always Moving On" containing poems of various modes of travel. Have class members select their favorites to read aloud.

SUBJECT: Social Studies, English

ACTIVITY: 1. Conduct a survey at a local bus station or railroad station. Observe the kinds of people who use public transportation at different times of the day. What kinds of people use the facility? - People going to work, shoppers, people going on

excursions, men, women, young people, senior citizens? Could the facility be expanded? What would make it meet the needs of the people to a greater degree?

2. Imagine three possible situations. The first involves taking a trip from home to California by automobile, the second involves taking the same trip by bus, and the third, by plane. Think about how these three situations would differ if you were actually involved in such a trip. What would you do differently in each case? Which would be more expensive? Which would save the most energy? Which would be most desirable personally? Write a story, poem or song describing the way you would go.

SUBJECT: Social Studies, Music, English

ACTIVITY:
1. Select a transportation system and depict the life of one person within it in a poem or song (e.g., bus driver, pilot, ship captain, mate, navigator, stewardess, conductor, engineer, etc.)

SUBJECT: Mathematics, Social Studies

ACTIVITY:
1. Accurately compare the relative safety of different types of transportation by citing statistics on numbers of injuries and deaths per transportation mode per year and numbers of injuries and deaths per accident. Make a graph of the figures.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies, English

ACTIVITY:
1. Interview a longshoreman or a person who works at a port. Ask for information about containerized cargo. Ask if this type of shipping is more efficient and how it works. Ask how this idea has affected the number of jobs available. Write a paper giving your views on containerization.

OBJECTIVE: To trace the history of transportation.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 1, 2, 3, 4

SUBJECT: Social Studies, Art, Language Arts

ACTIVITY: 1. Design a bulletin board and title it "Transportation Takes a Giant Leap Forward". Illustrate with pictures of:

A. 747 jet
B. Metroliner or Amtrak
C. Rocketship
D. Satellite
E. Other means of transportation

GRADE LEVEL: 4, 5, 6

SUBJECT: English

ACTIVITY: 1. Make a list of several kinds of transportation such as - automobile, train, bus, plane. Under each heading list the words we would not have in our vocabulary were it not for these inventions. Write a poem, short story or paragraph using the words.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Social Studies, English

ACTIVITY: 1. Trace the development of roads in the United States from the dirt trails used in colonial times to the turnpikes and parkways of today. Include the first hard-surfaced road of Lancaster, P.., which was made of sand and gravel. Also, discuss the National Road, the realization of Thomas Jefferson's dream of a road spanning the country from east to west.

SUBJECT: Social Studies, Language Arts

ACTIVITY: 1. Interview, in the classroom, someone's grandmother or an elderly person as to their view of the transport system today as opposed to the transport system fifty or more years ago. Questions may include:

a) How did people get to work long ago?
b) How much did a bus ride cost?
c) What personal means of transportation did people use?
d) What did people do on vacations?
e) How did children get to school?
f) Etc.

GRADE LEVEL: 5, 6, 7

SUBJECT: Art

ACTIVITY:
1. Design a postage stamp which commemorates the invention of the steam engine, airplane or some other type of transportation. Study other postage stamps to get the general feel for what is usually done. Do a large sketch of your design and a mock-up of the stamp in the size it will actually be.

SUBJECT: Social Studies, Art

ACTIVITY:
1. Create a diorama, using a shoe box, to illustrate an ancient mode of transportation. Comment on the environmental impact of this mode of transportation.

SUBJECT: Art, Social Studies, Science

ACTIVITY:
1. Develop a bulletin board showing the progression that has been made in sea travel. Trace this development from the sea vessels used by Vikings to present day ocean liners. Show the increase in distance travelled and the decrease in time spent trying to get from one place to another. Also, show the change in the type of power used in ancient and modern ships.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Develop a time line which illustrates the development of the U. S. Postal Service from Pony Express to airmail deliveries. Identify the points on the time line where such important events as World War I, World War II, the first airplane flight by Wright Brothers, and the invention of the automobile occurred. Examine relationships between these events and the development of more modern means of mail delivery.

SUBJECT: Social Studies, English

ACTIVITY:
1. Imagine that the automobile had never been invented. Concentrate on one decade and list the number of events which could not have occurred. For example - a) JFK would never have been assassinated in the motorcade, b) perhaps your father never would have met your mother, etc. Choose one event to write up.

SUBJECT: Social Studies, Science

ACTIVITY:
1. Using the bulletin board, develop a time line illustrating the development of air travel since its earliest days.

You might use magazine pictures, drawings, three dimensional cut paper figures, etc. Identify the dates of the following events on your time line: World War I, World War II, the first flight by the Wright Brothers, the invention of the reciprocating engine and the development of the jet engine. Add the date when the space shuttle is expected to be completed. Do you think that this means of transportation will play a great role in moving things and people about? (The same idea could be used for other means of transportation - cars, ships, trains, etc.)

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies, Science

ACTIVITY:

1. Develop a time line which illustrates the changes in train travel. Identify points on the time line such as 1) the development of the steam engine, 2) the changes in fuel from wood to coal to oil, 3) the invention of the Pullman car, diesel engine, electric engine, first transcontinental route, etc. What does the Metroliner indicate about future railroads? (The Metroliner is a crack East Coast train running primarily between New York and Washington. It attains speeds of 120 mph en route.)

2. The Egyptians built pyramids to honor a reigning king and the monument had to be completed before the king died so that his body could be placed inside. To build the Great Pyramid it took the continuous labor of thousands of people for 20 years or longer. Research and write a report on the transportation problems which the Egyptians faced and how they solved them.

SUBJECT: English, Social Studies

ACTIVITY:

1. Read the book called "The South Pass Story" by Robert West Howard, Putnam's Sons Publishers, New York. The South Pass crosses the Continental Divide in Wyoming. The Oregon Trail, California Trail and Mormon Trail all passed through it. It was frequented by Indians, explorers, cowboys, Pony Express riders and the cars and trucks of today. Discuss the book in class.

GRADE LEVEL: 7, 8

SUBJECT: English

ACTIVITY:

1. The great poet, Steven Vincent Benet, wrote, in a poem called "Western Star" - 'Americans are always moving on, It's an old Spanish custom gone astray, A sort of English fever, I believe, Or just a mere desire to take French leave, I couldn't say'. Discuss these lines. Why does Benet mention foreign countries? Are these lines true? Explain.

GRADE LEVEL: 7, 8

SUBJECT: Mathematics, Science

ACTIVITY:

1. Construct a graph showing the development in speed of human transportation from 1780 to the present. Let the x-axis represent time in years and the y-axis represent speed in miles per hour. Concentrate on the trend and relative scope of the change rather than on the accuracy of dates and speeds. (The graph should depict a slow, steady growth through the mid-1900's followed by an exponential increase with the advent of space travel.)

SUBJECT: English, Social Studies

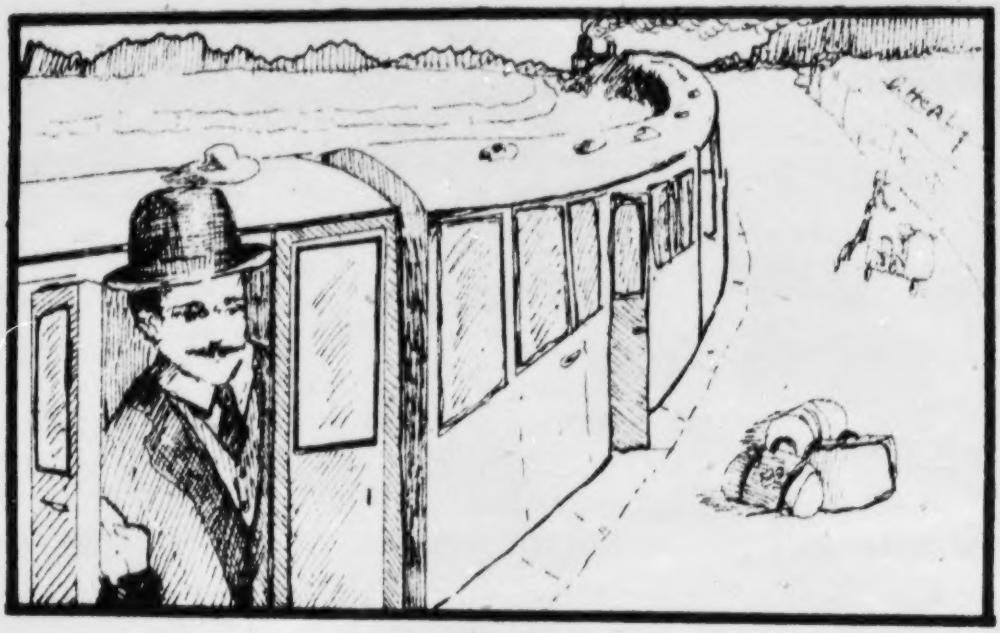
ACTIVITY:

1. Railroads, buses, subways, trains and automobiles have made it possible for people to live miles away from their work. Investigate and make a report on the conditions of city life in the early 1900's. Emphasize in your report the relationship of where people lived to where they worked and how they got from one place to the other. Explain the changes from the early 1900's to the present.

SUBJECT: Social Studies

ACTIVITY:

1. Prepare a written report showing the means of transportation employed by law enforcement officers from Colonial times to the present. What means of transportation was used in Colonial times and is still used today? How do modern means of transport facilitate the law enforcement officer's job?



OBJECTIVE: To analyze the relationship between land use and transportation.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies, Health, English

ACTIVITY:
1. Illustrate how you think your family's favorite recreation area (beach, lake, campsite) might look if you could get there by foot only. Demonstrate the relationship between land use and transportation.

SUBJECT: Social Studies, English

ACTIVITY:
1. Imagine that the Parkway or a local expressway has banned all traffic permanently. Write a composition describing what uses you would suggest for this land if they told you that you could have the land free if you could support the purpose for which you used it.

SUBJECT: Social Studies

ACTIVITY:
1. Draw a large outline map of the county or community and plot the different types of transportation such as train station, bus station and/or airport. Discuss land use in the community in relation to the map.
   a) Is the airport near private homes?
   b) Do the train stations provide adequate service?
   c) How important is terrain when considering a transportation site?
   d) Do buses provide adequate service?
   e) Are bicycle paths available?

GRADE LEVEL: 6, 7, 8

SUBJECT: Art, Mathematics, Social Studies

ACTIVITY:
1. After visiting or reading about an airport, draw a diagram of it using a rough scale. How many acres does it cover? Where is it located? (Many times, airports are built on land which might have been considered worthless by our grandparents; e.g. Newark Airport is built on an area once called swamp.) Explain how much more land is used by modern means of transportation than in historic times.

SUBJECT: Social Studies, Mathematics, English

ACTIVITY:
1. List the five most common types of transportation in decreasing order of their use of land. Explain the listing with a graph or a written paragraph.

GRADE LEVEL: 7, 8

SUBJECT: Mathematics, Science

ACTIVITY:
1. Find out, if you can, how much of the State of New Jersey is covered with roadways. For instance, how much land does the Garden State Parkway own and use? The Turnpike Authority? Other roads? If this were all put together, how many square miles would it cover? What percentage of New Jersey is covered with cement and asphalt?

SUBJECT: Mathematics, Social Studies

ACTIVITY:
1. Someone once said that the automobile had an insatiable appetite for concrete. Explain this statement in terms of how much land is used for roads.

SUBJECT: Social Studies, Health, English

ACTIVITY:
1. Write a letter to the Chamber of Commerce in your town. Ask if there are plans concerning safety, traffic flow, etc. Evaluate any plans in terms of effective land use, noise control, pollution control, and cost. If there is no plan, create one for your community. Your plan might be aimed at the future - perhaps 25 years from now.

SUBJECT: Social Studies, Science, Language Arts

ACTIVITY:
1. Discuss the transportation needs generated by the following land uses:

   a) Industrial
   b) Educational
   c) Recreational
   d) Agricultural

   What facilities can best serve these land uses? Consider speed, pollution, noise, cost, the future, etc. After the discussion, choose one of the above topics and develop answers for its transportation needs.

SUBJECT: Social Studies, English, Science

ACTIVITY:
1. Describe the effect of the automobile on the pattern of land use and environmental quality in the United States. Cite destructive land uses (sites for highways, parking lots, gas stations, etc.) which interfere with such natural processes as run-off and percolation. Also include air and aesthetic pollution, as well as other arguments you may think of to support your stand.

SUBJECT: Social Studies

ACTIVITY:
1. Ian McHarg, a land-use planner, recommends that alternate uses be identified for a given plot of land, based on its geological, chemical and biological features before a decision is made on its use. How would such an analysis affect the location of such cities as: Baton Rouge, La.; Newark, N.J.; your community - and the transportation systems now existing in those cities?

OBJECTIVE: To analyze the influence of transportation on the American economy.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Social Studies, Art

ACTIVITY:
1. Create a mural. On one side depict a farm. On the other side make a picture of a supermarket. In the center show various means of transportation. Describe how the produce gets to the store. Learning should be based on the economics of transportation. How much does the farmer get for his produce? How much does the supermarket charge? You might want to consider packaging, also.

GRADE LEVEL: 4, 5, 6

SUBJECT: Social Studies, Art

ACTIVITY:
1. Interview a merchant who sells fresh produce (such as vegetables or fruit), flowers, or fresh meat. Determine how far this product had to be shipped before it reached its present destination. Try to determine the various types of transportation which were used to ship this one particular item. (i.e., it is not unusual for flowers to come from South America, fruit from Australia, etc.). Make a large map of the world and indicate where things come from.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Science, English, Social Studies

ACTIVITY:
1. Under the titles Water, Air and Land, list as many kinds of transportation as you can. Indicate which are the most important, which are least important. Tell why. Choose one on which to write a paragraph explaining its effect on the national economy.

GRADE LEVEL: 6, 7, 8

SUBJECT: English, Social Studies

ACTIVITY:
1. Victor Gruen is a city planner who advocates that cars be kept out of the city. In business and shopping areas, he would turn the streets into pedestrian malls. Debate the pro's and con's of Mr. Gruen's plan. Include in your arguments the effect of such a move on business. Could you apply this to your own community?

SUBJECT: Science, Mathematics, Social Studies

ACTIVITY:
1. Research the amount of fuel saved when speed limits are

lowered as they have been during our energy crisis. Do lower speeds have any effect on traffic safety? Is there a problem with congestion when cars travel more slowly? Prepare your report in an original way to present to your class.

SUBJECT: Science, English, Social Studies

ACTIVITY:

1. Making tires for trucks, planes and cars is a big business in the United States. Research and report on the development of the rubber industry as related to its use in making tires. Write to Firestone, Goodyear or Michelin Tire Companies for information. What is the place of synthetics in tire manufacturing? Where do the synthetics come from? Find out how many Americans are employed by the tire industry.

SUBJECT: Social Studies

ACTIVITY:

1. Fifteen percent of American workers depend on the transportation industry for their livelihood. After some research, do you believe this figure will go up or down? What will this do to the American economy of the future?

GRADE LEVEL: 7, 8

SUBJECT: Social Studies, Mathematics

ACTIVITY:

1. Accurately draw a pie chart which shows the percentage of the Gross National Product which is contributed by the transportation industry. Also, show the portion of that percentage which is contributed by the automobile industry.

SUBJECT: Social Studies

ACTIVITY:

1. Describe the influence of transportation on the American way of life in economic and social terms. (Actually, the influence is a pervading one. Transportation contributes 20% of the Gross National Product, 15% of the labor force, etc.) Also, the role of the automobile in the United States lifestyle (number of cars per family, seating capacity, etc.) is an integral part of the economic and social scene.

2. With all the progress we have made in the field of transportation, there are still some things that are cheaper to move by barge - for instance, coal is still moved across the Great Lakes by barge because it is so heavy and one small tug can move the barge. Research and discuss other products that are transported this way. If you live near a seaport or waterway, observe tugs and barges at work. What is the role of barges and canals today?

3. Evaluate the argument that a National highway network is necessary for national security reasons. Can the same logic be applied to all modes of transportation? What effect does the presence of long range nuclear weapons have on your argument?

4. On a map identify the routes of the Northern and Southern Pacific Railroads. The National Highway (Route 40), the Mississippi and the Ohio Rivers. Compare the general directions of these natural and man-made transportation facilities. Accurately describe what significance these directional differences were to the settlement of the Western frontier.

SUBJECT: Guidance, Social Studies, English

ACTIVITY:

1. Research and report on the careers that are available in the area of transportation. Questions to be researched might include:

   a. What training is required.
   b. What salary will be earned.
   c. What are the benefits?
   d. What are the hours?
   e. What will the future hold? Will there be more or fewer jobs of this type?

2. Examine a copy of "Who's Who in Commerce and Industry" at the Public Library. Write a report on the life of a corporate executive in the transportation industry. As additional sources of information, consult "Poor's Register of Corporations, Directors and Executives".

SUBJECT: Language Arts, English

ACTIVITY:

1. Write a play and dramatize it around the theme that the automobile is an illegal weapon and the use of it is suddenly banned. One scene might include the man who sold his Cadillac for 10 cents - horses and skate boards now sell for five thousand dollars.

SUBJECT: Mathematics, Social Studies, Science

ACTIVITY:

1. Discuss the fact that since the 1920's the United States population has doubled, but the number of automobiles has increased by nearly 800 percent and that the average person per auto is 1.2 percent. Construct a line graph illustrating the population growth and the growth in automobiles in the United States in the last 50 years. Can you link this to pollution problems as well as economic ones.

OBJECTIVE: To relate modes of transportation to their energy sources.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Science, Language Arts

ACTIVITY:

1. Illustrate some forms of transportation that you or members of your family use. Then, accurately connect (with pictures) those methods to the forms of energy they require.

GRADE LEVEL: 3, 4, 5

SUBJECT: Science

ACTIVITY:

1. After each of the modes of transportation in the following list, place an S, E and/or P to indicate whether that mode can be operated by steam, electricity or petroleum. Underline the most common type of energy source used. 1. Train, 2. Automobile, 3. Ship, 4. Airplane, 5. Bus.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: English, Social Studies, Science, Art

ACTIVITY:

1. Look at the book called The Wonderful World of Transportation by Lee and Lambert Doubleday, Garden City Books, Garden City, N. Y. It is divided into three sections dealing with land, water and air transportation. There are great pictures in this book and exciting reading. Use it as a reference for reports or art work.

2. Trace the development of energy as related to a phase of transportation (e.g., from primitive boat to modern ocean liner or nuclear powered submarine; from the first sketches of a flying machine to supersonic flight and space ships.) You might want to include projected ideas for future forms of travel or ideas of your own.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies, Art, Language Arts, Science

ACTIVITY:

1. Create a bulletin board relating buses, planes, trucks cars, boats, etc. to their main energy source - oil. Show where oil comes from - Pennsylvania, Texas, Alaska, Iran, Saudi Arabia, etc. Show the different routes the oil would have to take to reach your state. Also show the types of transportation which would be necessary to carry this oil.

SUBJECT: Art, Science

ACTIVITY:

1. Develop a flow chart on the bulletin board showing the route followed by petroleum from its subterranean reservoir to the combustion chamber of an engine.

GRADE LEVEL: 6, 7, 8

SUBJECT: English, Social Studies, Science, Art

ACTIVITY:

1. Choose two other people with whom to work. From the list below, each group is to choose one topic, research the topic and present an oral report to the class, accompanied by frieze panels.

    a) The steam engine
    b) The internal combustion engine
    c) Electricity
    d) Nuclear energy
    e) Other forms of energy

    In the frieze and in the report, show how transportation has been affected by the development of the technology.

GRADE LEVEL: 7, 8

SUBJECT: Science, English, Social Studies

ACTIVITY:

1. The Hindenburg was a dirigible. It had a luxurious lounge, large dining rooms, and staterooms. On May 6, 1937, an accident in Lakehurst, New Jersey caused the end of mass travel by Zeppelin. Research the principle on which it worked and its fuel source. Write a report listing your findings. Why aren't dirigibles used today as passenger ships?

GRADE LEVEL: 7, 8

SUBJECT: Science, Art

ACTIVITY:

1. Research the internal combustion engine, the steam engine and the Wankel engine. Draw diagrams showing how each works and how each burns fuel. Describe the disadvantages and advantages of each engine.

SUBJECT: Social Studies, Science

ACTIVITY:

1. Discuss the concept of a natural resource reserve. Is it a contrast figure? How long will the known oil reserves last? What happens when the reserve is used up? On a world map, identify the nations which control most of the known oil reserves. With which of these countries is the United States not friendly? What percentage of the oil reserves do these countries control? Discuss the possibility and advisability of the United States becoming energy independent by 1980.

SUBJECT: Mathematics, Science

ACTIVITY:

1. Construct a bar graph which shows the amount of petroleum used by automobiles, by railroads, by aircraft, by buses and by ships. For the purpose of comparison, show a second set of bars labeled "other fuels" for the same five transportation modes.

SUBJECT: Science

ACTIVITY:

1. Arrange the following five fuels in their order of importance in 1970, 1980 and 1990 - coal, gas, oil, nuclear fuel, solar energy. Write an explanation of your arrangement.

OBJECTIVE: To analyze the impact of transportation on the energy crisis.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Science, Social Studies, Art

ACTIVITY:

1. Create a picture or poster which shows two alternate methods of travel which save more energy than cars.

GRADE LEVEL: Mathematics, Social Studies, Science

ACTIVITY:

1. The transportation of today relies most heavily on fossil fuels, particularly coal and oil. Fossil fuels are growing increasingly scarce and the energy crisis we suffer today will not just go away. What can we do in the area of transportation to save fuel? Illustrate your suggestions and present them to another class.

GRADE LEVEL: 5, 6

SUBJECT: Science

ACTIVITY:

1. Arrange the following list of transportation types in order from the most energy-efficient to the least efficient - train, airplane, automobile, bus, pipeline. Explain the reason for your arrangement.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Illustrate what changes might happen in your family and what might happen to the environment in your town if there was no more fuel for cars, busses, trucks, planes. How would this affect the economics of us all? Would there be an energy crisis? Why or why not?

2. Make a survey of some people you know on how the energy crisis has affected their lives. Give a report to the class on what you find.

SUBJECT: Science, Social Studies, Mathematics

ACTIVITY:

1. Interview some people who commute to work by car. Determine the average daily and weekly amount of fuel consumed and the cost. Imagine that each person started a car pool in which four people rode in each car. Compute the amount of gas and money saved by using one car instead of four.

GRADE LEVEL: 6, 7, 8

SUBJECT: Science, Social Studies, English

ACTIVITY:

1. Show that you understand the relationship between the energy efficiency of different modes of transportation (automobiles, trains, etc.) and their impact on the energy shortage by writing an essay ranking and comparing four different modes of transportation in this regard. The mode you rank first should be the most energy efficient.

GRADE LEVEL: 7, 8

SUBJECT: Science, Industrial Arts

ACTIVITY:

1. Discuss the various sources of energy such as chemical, mechanical, solar, atomic, etc. Construct a model car, ship, truck, airplane, etc. that would operate on a solar battery or other energy source. Explain how this kind of car would help in the energy crisis.

SUBJECT: Social Studies, Science, Language Arts

ACTIVITY:

1. You are a writer for a newspaper. Write an article defending or refuting the notion that the energy crisis is good for the environment. Some ideas to consider might be - (a) fewer cars on the road mean less air pollution, (b) the need for better gas mileage has led some people to disconnect pollution devices.

SUBJECT: Science, Social Studies

ACTIVITY:

1. You have been appointed Chief Energy Advisor to the President and charged with the responsibility for making short-term and long-term recommendations regarding alternative modes of transportation in light of the energy shortage. In developing your proposals, consider -

   A. What alternatives will you present (e.g., mass transit vs. individual cars, gasoline vs. atomic energy)?

   B. What effects will each alternative have on the environment? Explain how pollution will be affected.

   C. What effects will each alternative have on natural resources such as oil, coal, uranium, etc.?

   D. What effects will the altneratives have on society (i.e., lower class vs. upper class, leisure activities, economic mobility)?

   E. What effects will each alternative have on the economy (large companies, packaging companies, etc.)?

F. Which alternatives do you endorse and why?

SUBJECT: Social Studies, Science, English

ACTIVITY:

1. Mohandas Gandhi, a great leader in India, once said that India had been conquered by "moderr civilization through railways, telegraph, telephones, and almost every other invention which has been claimed to be a triumph of civilization". He also said that "By working with machines we have become machines ourselves". In light of the problems of the energy crisis, write a paper either refuting or supporting Gandhi's point of view in relation to the dependence of Americans on the automobile.

SUBJECT: Social Studies

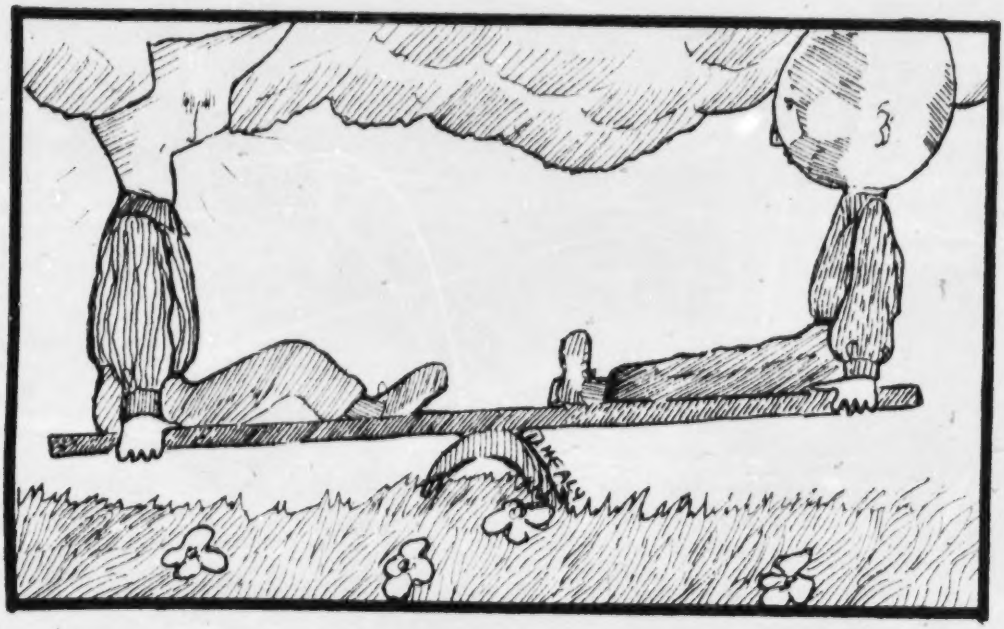
ACTIVITY:

1. In 1969, Dr. Paul Cherington, who was Assistant Secretary of Transportation for Policy and International Affairs, said "In the United States, we have enough car seats on the road for every man,woman and child - with enough seats left over to hold the entire population of continental Europe." (Quoted from 'National Geographic', Sept. 1969, Vol. 136, No. 3.) What does this statement indicate about the efficiency of automobile usage in the United States. Can you apply this to your family car? Relate this to the energy crisis.

SUBJECT: Mathematics, Social Studies, Science

ACTIVITY:

1. Draw a graph showing the relationship between transportation energy growth and population growth. Let the x-axis represent population growth and the y-axis transportation growth. Explain how this relates to an energy crisis.



OBJECTIVE: To describe the economic structure and organization of segments of the transportation industry.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4, 5, 6

SUBJECT: Social Studies, Mathematics, Science

ACTIVITY:
1. What is an energy crisis? If everyone walked, rode a bicycle, or a horse, and if we shipped all our materials and products by row boat, would we still have an energy crisis? Why or why not? What other needs outside of transportation do we meet by burning oil and coal? Give a "guesstimate" as to what percentage of our fossil fuels are used for transportation. Make a pie chart showing that percentage.

GRADE LEVEL: 2, 3, 4, 5, 6, 7, 8

SUBJECT: Social Studies, Mathematics

ACTIVITY:
1. Illustrate three methods of transportation you or members of your family have used, who you pay to use that form of transportation, and what the payment actually buys. Students should see the relationship between money and transportation.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Describe some actions which an individual can take to combat the energy crisis. After you have made a list of such actions, try to categorize them. Which are legal in nature (i. e., reduced speed limits on the highways), which are social (car pools), etc.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Try to find out the position of the AFL-CIO on such important issues as mass transit, subway fares, the highway trust fund, the oil depletion allowance and federal support of bankrupt railroads. Do you agree with these viewpoints? Why or why not?

SUBJECT: Social Studies, English

ACTIVITY:
1. Referring to back issues of the "New York Times" or other papers or magazines, read articles on transit strikes in New York City. Take a position on whether or not transit workers should be allowed by law to strike and thus cripple a city. Write a paper supporting your position. If enough people are interested, you could have a debate.

OBJECTIVE: To identify the roles of selected governmental agencies in transportation planning.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Social Studies, Safety, Health

ACTIVITY:

1. Identify who makes the rules about where you can ride your bike, where you can cross a busy street and on what side of the street your parents can drive the car. Draw a picture of yourself on your bike or riding in a car, or crossing a street at an intersection. Tell who makes the rules about where you can ride your bike, cross the street, what side of the road to drive on, etc.

GRADE LEVEL: 2, 3, 4, 5

SUBJECT: Social Studies, Safety, Health

ACTIVITY:

1. Visit a car dealer at his place of business. Ask him to identify safety features of new cars. Talk to him about new pollution controls and their effect on gas mileage. Who makes the rules about safety features, pollution devices, etc.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: English, Social Stucies, Science

ACTIVITY:

1. Write a letter to the New Jersey Department of Motor Vehicles asking for information on laws controlling pollution from automobiles. Interview one of the inspectors in your local Motor Vehicle Inspection Station. Find out how many cars fail to pass the inspection test for faulty pollution problems and what the procedure is to correct the problem.

GRADE LEVEL: 6, 7, 8

ACTIVITY:

1. To ride a motorcycle one must wear a helmet. Who made this law? Why? Is the law a good one? Some cyclist believe if they want to ride without a helmet and take a chance on getting killed, that's their business. What other safety regulations might fall in the same category? Name them. Why is this kind of legislation different from pollution devices on cars?

SUBJECT: Social Studies

ACTIVITY:

1. Describe two federal actions which result in lower oil prices and two which result in higher oil prices. Describe what effect these actions have on transportation and the energy crisis.

SUBJECT: Social Studies, Science, Art

ACTIVITY:

1. In 1968 the federal government supported different types of transportation in the following way:

Highways	Air Travel	Waterways	Mass Transit	Railroads
70%	15%	14%	1%	0.2%

In some interesting and pictorial way illustrate these figures to post on your bulletin board. Does the trend still hold today?

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Make a list, and if possible, an organizational chart of the city, county and state elected and appointed officials with the duties of each office. The League of Women Voters can probably supply you with this information. If not, consult the city charter or the city or state government Directory. An alternate source would be the "Institute for Political Education" curriculum manual entitled 'New Jersey Goverment - An Issue Analysis Approach'. Analyze the list or chart to determine the agencies responsible for transportation matters. Where are the areas of overlap?

2. Describe some problems that arise when goods are transported from one country to another. What regulations are required? Who makes these regulations?

SUBJECT: Social Studies, English

ACTIVITY:

1. Describe orally or with a written report the attitude of the Federal Government regarding mass transportation as reflected in its legislative actions.

SUBJECT: English, Social Studies, Science

ACTIVITY:

1. In Antoine de Saint-Exupery's book, "The Little Prince", the Prince approaches a snake on the Planet Earth. He says to the snake, "You are not very powerful. You haven't even any feet. You cannot travel." Write an essay in which you relate facts to back up your point of view on the idea that the technology of transportation is directly related to the power of nations.

2. What role does the N. J. Department of Transportation play in transportation planning? Contact them in Trenton and request the latest edition of the State Master Plan for Transportation. Look through this report. Summarize what it says about various kinds of transportation. Report to your class using an overhead projector to project the diagrams in the booklet.

OBJECTIVE: To evaluate the impact of surface, air and sea transport facilities on the environment.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 1, 2, 3, 4

SUBJECT: Art, Social Studies, Science

ACTIVITY:
1. Arrange a display table in your classroom depicting the various modes of transportation you have constructed from modeling clay, cut paper, or plaster of paris. Carefully design the layout so that it shows a scene which reflects good environmental design.

GRADE LEVEL: 2, 3, 4

SUBJECT: Social Studies, Science, Art

ACTIVITY:
1. Draw a picture of some form of transportation and explain how it affects the environment.

GRADE LEVEL: 2, 3, 4, 5

SUBJECT: Social Studies

ACTIVITY:
1. Make a list of as many ways of transportation as you can. Rank them as to degree of pollution they produce. Rank them again as to degree of use. Compare the two lists. Can you explain them?

GRADE LEVEL: 3, 4, 5,

SUBJECT: Social Studies, Language Arts, Science

ACTIVITY:
1. Discuss the types of transportation used by American Indians. Construct a display showing such things as canoes, travois, horses, and going on foot. Explain how they affected the environment.

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Social Studies, Science, English, Art

ACTIVITY:
1. Select one mode of transportation and do an illustrated report on it. Tell its advantages and disadvantages. Include the effects it has on the environment. For younger children this can mean collecting pictures or drawing them. Older students might plan photographic essays.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Art, Social Studies, English, Science

ACTIVITY:

1. In the book, The Wonderful World of Engineering, by David Jackson, Doubleday, Garden City Books, Garden City, New York, there are some fascinating pages on how bridges, roads, tunnels, canals, airfields, etc. are built. Look up this book and write an explanation of how a transportation facility is made. Illustrate your work.

SUBJECT: Social Studies, Science

ACTIVITY:

1. Determine the clarity of the water in a stream near a highway construction site. This can be done using a device called a Secchi disc, which is a round piece of wood with alternating black and white pie-shaped wedges painted on the face. With a weight attached to the center on one face and a long cord attached to the other, the disc is lowered into the water until it disappears. The depth at which the black and white design disappears is a measure of the turbidity of the water. Repeat this procedure at points above and below the construction site. Construct a graph to depict the change in water clarity caused by the construction.

2. Using one of the air pollution test kits, test the air at several sites in your community for carbon monoxide, sulfur oxides and nitrogen oxides. Examine the characteristics of the test locations to determine the probable sources of these pollutants. Do the levels exceed Federal standards for these compounds? If so, what can be done or is being done? Air pollution devices on cars and trucks lower gas efficiency. What do we need - cleaner air or greater utilization of fuel in this energy-short time?

3. Contact the transportation department of your local Board of Education to determine what air pollution devices have been installed on the school buses. Ask a member of the department to speak to your class describing the devices and estimating the cost of the devices, additional gasoline, etc., to the public. Why or why not are the devices worthwhile?

GRADE LEVEL: 6, 7, 8

SUBJECT: English, Social Studies, Science

ACTIVITY:

1. Make a report to your class on the effects of boating and shipping on the ocean and lakes. Choose between recreational and commercial ventures. What environmental effects do motor boats have on lakes? Why is there great concern about oil tankers on the oceans? There are many newspaper and magazine articles on this topic, as well as books.

2. Compare transportation by trucks with transportation by railroads. Which is used most? Which is the most environmentally degrading? Why is one favored above the other? Do you think that the government should do something about the problem? If so, what?

3. Do you believe that "We are well on our way to winning the war against environmental degradation - well on our way to making peace with nature"? What steps can each of us take in the field of transportation to ensure "our peace with nature"?

SUBJECT: Science

ACTIVITY:

1. There is a great deal of controversy about the new plane called the SST. Do some research on it. What are the advantages of its huge size and great speed? What are the deterrents? Include air pollution, sonic booms over land and the ocean, etc. Should this plane be allowed to land at our airports? Where is it now used?

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Consult the 'Conservation Report' of the National Wildlife Federation to determine what legislation is pending in Congress which deals with transportation/energy/environmental problems. (This newsletter provides a brief summary of the progress of environmental legislation and a "box score" of the action taken on selected bills.) Copies of these bills can be obtained from your Congressman. Maintain a box score of your own on the classroom bulletin board.

SUBJECT: Science, Social Studies

ACTIVITY:

1. Compare the cruising speeds, range in miles, cost per mile and air pollution resulting from electric cars, steam engines and the internal combustion engine. Determine which are less expensive to operate and less polluting. Why is the internal combustion engine used so much and the others so little?

SUBJECT: Mathematics, Science

ACTIVITY:

1. Construct a chart showing the changes in vehicle speed throughout recorded history. Have several columns such as date, average speed and fastest speed. Include such important milestones as the speed of a chariot, walking speed, automobile speeds, etc. (Good source of information is Future Shock by Alvin Toffler, New York, Random House, Inc., 1970. p. 26.) What is the relationship of speed to the environment?

OBJECTIVE: To evaluate a plan for financing the cost of transportation.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 4, 5, 6

SUBJECT: Social Studies

ACTIVITY:

1. If you owned several bikes and wanted to rent them to your friends, how would you charge them? Students should be able to perceive a connection between need for transportation and need to finance it.

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies, Mathematics

ACTIVITY:

1. Construct a pie chart depicting the sources of income for your municipality. Appropriate categories might be state sources, federal sources and locally derived funds. A copy of your city's operating budget is probably available at City Hall. Are any of these funds being used for transportation? If not, why not?

2. What kinds of transportation are available to the people in your community? Who pays for the maintenance of the system? Is it paid for by fares, taxes, etc? What happens when expenses rise?

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Mrs. Angel Rooney, a participant in Washington, D. C.'s Emergency Committee on the Transportation Crisis, has labelled mobility a basic American right. If this is true, what does it imply about how mass transit systems should be supported? (Student should recognize that the existence of mobility and basic American right implies a Federal responsibility to guarantee citizen access to transportation facilities.)

2. What effects would the following types of fare structures have on the mass transit industry:

   A. Flat fare
   B. Zone fare
   C. Transfer charge
   D. Class fare
   E. Discounts
   F. Promotional
   G. Retailer-cooperative

   Discuss what each type is. Choose which one you think would make people want to ride instead of drive.

3. Correctly identify the Highway Trust Fund. Does it provide money for the construction of highways only? Write a paragraph telling what the Highway Trust Fund is and does. Explain to your class.

SUBJECT: Social Studies, English

ACTIVITY:

1. The American economic system is based on a spirit of competition. Governmental support of an industry will tip the balance in favor of that industry at the expense of its competitors. What are the implications of this for the argument of governmental support of mass transit? (The student should recognize that in a pure free-market system, prices and services are established through open competition. Governmental support of one segment of the mass transit industry eliminates competition and alters the American "free" market.) In spite of this, do we need federal support of transportation facilities.

2. Adopt the roles of a local planning board member, the president of a trucking firm, the head of the shipping department of a local manufacturer and the leader of an ecology organization who are attending a meeting to discuss an upcoming hearing on a federal transportation act. The object of the meeting is to prepare testimony for the hearing to support or oppose the use of appropriated funds for mass transit rather than highway construction.

3. As the means of transportation become more efficient, trade expands to include larger areas. Considering this, pretend that you are a lobbyist in Washington. Write a position paper arguing for or against federal support of mass transportation systems.

4. Select one of the following suggestions for financing transportation. Give one reason for selecting the suggestion you did and one reason for rejecting each of the other suggestions.

   A. Federal and state taxes
   B. Fares
   C. A combination of fares and federal tax monies
   D. Local taxes

5. You are the Governor of your state. One of your aides has devised a system whereby a surcharge would be added to the income tax of anyone working in your state to help pay for development of better roads and a mass transit system for the cities. Another aide has suggested a state bond to pay for mass transit systems and more highways. You must present one of the above or an alternate plan to the people of your state. Research the issues and write a paper reflecting which would be the best choice.

SUBJECT: English, Social Studies, Science

ACTIVITY:

1. Imagine that you are a multi-millionaire. Three companies ask you to lend them money. One company is involved in drilling off-shore oil wells, one is involved in developing a nuclear power plant. The third company is involved in starting a hydrofoil system of transporting people to New York City during the rush hours. Which of the three companies would you lend money to if you were interested in helping alleviate the energy crisis? Support your choice in terms of the company which offers the best solution for the most people with the least problems.

2. Predict the effects the following state and federal activities would have on transportation on the energy crisis:

   a. Increasing the oil depletion allowance
   b. Increased federal oil leasing
   c. Limiting oil imports
   d. Imposing governmental pollution controls

   Does raising oil prices reduce the demand for oil? Is reducing demand likely to result in a shift toward low energy intensive transportation systems?

OBJECTIVE: To analyze the relationship between the development of transportation and social mobility.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4

SUBJECT: Social Studies

ACTIVITY:
1. Draw a map of your family's favorite vacation spot. Discuss the way you get there, the means of transportation employed, time involved, cost for tolls, etc. Plan an alternate means of transportation if a car were not available.

GRADE LEVEL: 2, 3, 4, 5

SUBJECT: Social Studies

ACTIVITY:
1. Discuss the fact that Americans today have much more mobility than any other people. Where do your grandparents, aunts and uncles live? Where were your parents born? How often have they moved and what means of transportation did they use? How often do you travel to see your relatives and how far do you go? What one factor makes us such a mobile country?

GRADE LEVEL: 2-8

SUBJECT: Social Studies, English

ACTIVITY:
1. Write a story describing what would happen if all cars suddenly vanished. Wow! Make it exciting and funny.

GRADE LEVEL: 5, 6, 7

SUBJECT: Social Studies, Art

ACTIVITY:
1. Create a mural to illustrate various ways of travel over the decades. You might want to use the following years: the present, 1910, 1850, 1800, 1700, 1600, 1500. How many miles a day would a person be able to travel in each era?

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Describe the impact which the development of transportation has had on the mobility of Americans by comparing the amount of traveling you have done to that which your parents and grandparents have done. You should cite such statistics as miles travelled per year or number of states visited to show that you enjoy greater mobility than your parents or grandparents.

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:
1. Discuss the abundance of stores, jobs and shopping areas in the cities compared to suburbia where these places are usually more dispersed and require additional transportation to reach them. What does the term "bedroom community" mean?

SUBJECT: English, Career Education, Social Studies, Science

ACTIVITY:
1. Make a study of the career of a famous person concentrating on the number of geographic moves he made as his career advanced. Report to the class.

SUBJECT: Social Studies, Science, English

ACTIVITY:
1. Before James Watt made his steam engine, no city on the earth had a million people. Consider the hypothesis - Modern technology makes it possible for many people to live in cities. React to the above hypothesis especially in relation to the technology of transportation.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies, Science, English

ACTIVITY:
1. Our everyday actions reveal the values that we live by. Consider the following questions about educational decisions in the area of transportation. What do the answers reveal about our position on the energy crisis? What lessons are we teaching when we permit students to drive to school, and at the same time cut back on field trips to conserve gasoline? How much of your school grounds is set aside for automobile parking? Does your Board of Education insist that its buses be well-tuned with adequate air pollution control devices?

SUBJECT: Social Studies, Mathematics, Science

ACTIVITY:
1. By 1920 Detroit was the automobile center of the country. In ten years its population increased by half a million. Investigate other cities in which population growth can be directly related to some form of transportation, such as the coming of the railroad. Illustrate the results of your research on a line graph and show the relationship of population growth to transportation in ratio wherever possible.

OBJECTIVE: To compare mass transit vs. personal transportation.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 2, 3, 4, 5, 6, 7, 8

SUBJECT: Art

ACTIVITY:

1. Organize a poster contest in your class, school or grade level to encourage the use of public transportation. Award prizes for the most original, and the most artistic posters.

GRADE LEVEL: 5, 6, 7,

SUBJECT: Social Studies, English, Science

ACTIVITY:

1. Write a T.V. commercial for a railroad in which the announcer tries to "sell" the idea of commuting by train instead of by bus or car. Role play the announcer and have the class play the part of the audience. Be sure to emphasize such strong points as the cost, speed and environmental soundness of train travel. Take a vote in your class before and after hearing the commercial to see if anyone changes his mind.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Art, Social Studies

ACTIVITY:

1. If you were given a beautiful piece of unspoiled land through which people had to travel, what form of transportation would you wish to use? What form would be least polluting, and do least damage to the land, plants and animals? Make a map or diagram of the property. Include forests, hills, rivers, etc. Superimpose the transportation system on your diagram.

SUBJECT: Social Studies, Mathematics, Art

ACTIVITY:

1. Draw a map showing some of the toll roads, tunnels and bridges within your state. Compute the cost of travelling from one side of the state to the other using information from this map.

2. A. Draw a map plotting a transportation route from Point A (home) to Point B (job). Obtain information from parents.

   B. Use the above mentioned map to compute the differences in expense and time, using personal transportation vs. mass transit.

SUBJECT: English, Art, Social Studies

ACTIVITY:

1. Rapid transit systems are generally deserted in non-rush

hours - yet, people still drive their cars during these hours. Design an ad with a caption which could be placed in the newspapers to entice people to use mass transit during these off hours.

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Interview a person who gets to his job in any other way than by driving. Questions might include:

   A. What is the distance to your job?
   B. How long does it take?
   C. What disadvantages and advantages does walking create?
   D. Why don't you drive to your job?
   E. Is there another means to get there?

   Report to the class concerning this interview.

2. Discuss the relationship between the availability of transit facilities in the cities and the suburbs compared to the availability in the farmlands or sparsely populated areas. What would a bus or train schedule be like in the country as opposed to the suburbs or the city? Explain the possibilities of getting from your home to the nearest large city. By how many means could you go? How long would each take? How much would each cost?

SUBJECT: Social Studies, English

ACTIVITY:

1. Write a television commercial for a bus company in which the announcer tries to "sell" the idea of commuting by bus instead of car. Role play the announcer and have the class be the TV audience.

2. The San Francisco Bay area grew very rapidly and there were many transportation problems. Research BART (Bay Area Rapid Transportation), one of the best known mass transportation systems. Can this system be used elsewhere? Why or why not?

3. Plan a mock campaign on the issue of mass transportation vs. personal transit. Put the campaign on in your class or school. Have your classmates or schoolmates vote on the issue.

SUBJECT: Social Studies, Science

ACTIVITY:

1. Describe at least three alternate routes using five different types of transportation you could use to get from your home to New York City. Be imaginative!

SUBJECT: Social Studies, Mathematics

ACTIVITY:

1. Ask some member of your family to keep a tally of cost of using his car for a week. Include in this figure the breakdown on the original cost of the car, insurance, tolls, gas, maintenance, etc. Compare this figure to the cost of making the same trips by public transportation. Compute the difference in percentage, showing the results on a line graph in terms of a weekly, monthly and annual estimate. Why do people still use cars?

GRADE LEVEL: 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Do some research on what the viewpoints of your Congressman is on mass transport. What does he recommend to encourage or discourage the use of mass transit. What is his voting record?

SUBJECT: Social Studies, Mathematics

ACTIVITY:

1. Develop a density graph to illustrate the abundance of jobs in the city as opposed to jobs in the suburbs, hence the daily exodus from the suburbs tc the jobs in the city - demonstrating the need for mass transit. What types of transportation are available in your community for commuting to the city? What types of transport are available within the city?

SUBJECT: Mathematics, Social Studies

ACTIVITY:

1. Investigate the cost of taking a car to work as compared to the cost of public transportation. Computer the cost per gallon of gasoline and the mileage. Figure the cost using public transport. Which means is least expensive? Have you thought about insurance costs and depreciation in value of the car?

OBJECTIVE: To predict future changes in transportation networks and facilities.

PROBLEM AREA: Energy - Transportation

GRADE LEVEL: 4, 5, 6, 7, 8

SUBJECT: Art, Science, Social Studies

ACTIVITY:

1. Draw a picture of what you think a boat, plane or train will look like in the year 2000. What will it be powered by? Will it have a fixed route? The design should be consistent with the environmental conditions, fuel source availability and population sizes of the twenty-first century as evaluated by the teacher.

GRADE LEVEL: 5, 6, 7, 8

SUBJECT: Social Studies, Science, Art

ACTIVITY:

1. Draw a picture of what you think cars will look like in the future. Be able to explain why your car looks the way it does.

   A. Will future cars be smaller or larger?
   B. What form of energy will they use?
   C. What material will they be made from?

GRADE LEVEL: 6, 7, 8

SUBJECT: Social Studies

ACTIVITY:

1. Discuss the following: In light of the energy crisis and the fact that we are running out of fossil fuels, should we be building more and more highways, or should we be concentrating on various sytems of mass transportation?

SUBJECT: Social Studies, Science

ACTIVITY:

1. What are the energy sources of the future? How will they affect transportation. Is it possible to have a nuclear driven car? (We already have nuclear submarines.) What other forms of energy can be used to make vehicles run?

2. State some limitations which will have to be taken into consideration when future transportation networks and facilities are being developed. Discuss them.

3. Design an imaginary form of mass transit that you would like to see built. Describe changes that would have to be made in present systems to build your design.

SUBJECT: Social Studies, English

ACTIVITY:

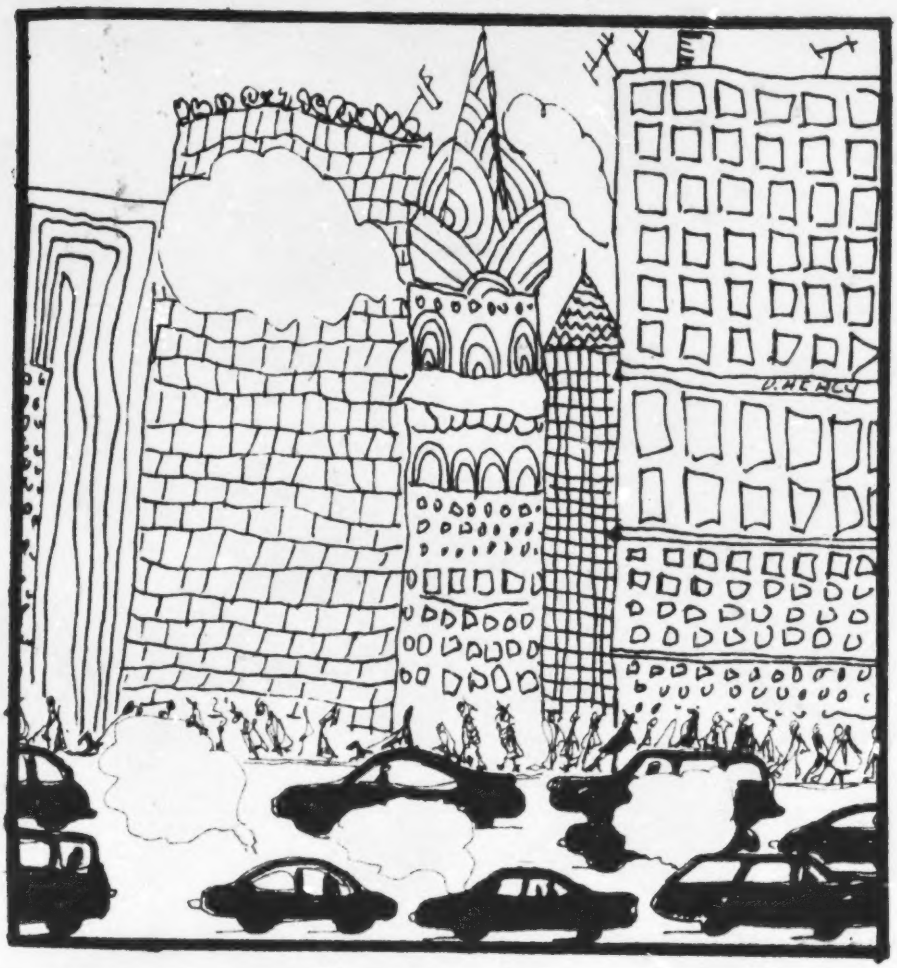
1. Imagine that you are the mayor of a large urban area. You have complaints from the small shop owners. They are losing business because there is a traffic and parking problem in the city. Many of the larger department stores have moved out to the suburbs where there is much more space for free parking. This has also resulted in the loss of jobs in your city. What steps would you take to solve this problem? Use your imagination to come up with ideas which would indicate planning for the future.

GRADE LEVEL: 7, 8

SUBJECT: Social Studies, English

ACTIVITY:

1. Discuss the following: Future transportation facilities will be mass transit systems which are supported with funds from regional governmental agencies. After the discussion, have students write up a brief paragraph defending or refuting the statement.



INTERESTING SUPPLEMENTARY REFERENCES

BOOKS:

Have You Seen Roads?, Oppenheim. Young Scott Books, New York. 1969. Author has combined poetry and photographs of city streets, throughways, tunnels, waterways and airways. Grades 1-4.

Highways and Our Environment, J. Robinson. McGraw-Hill Book Co. New York. 1971. Profusely illustrated book identifies the commercial forces which over-control the number, placement and design of highways through pressure and propaganda. Author criticizes the belief that we must continue to build more highways to match the increasing number of cars. Grades 7 and 8.

Problems of Mass Transportation, D. Reische. H. W. Wilson Co. New York. 1970. A series of readings excerpted from a number of sources as diverse as The Christian Science Monitor and Senior Scholastic. While the topics of the automobile, commuting, passenger trains and air travel are treated in different sections, an editor's introduction to each shows the relationships. Includes an overview of all types of transportation and a chapter on future trends. Grades 6, 7, 8.

America Forever New, A Book of Poems, compiled by Sara & James Brewton. Thomas Y. Crowell Co. New York. 1968. A book of poetry whose purpose is to enlarge our awareness of the country and give us fresh delight in its complexities. Contains many examples of poems which can be linked to the study of transportation - roads, boats, cars, trains, etc.

FILM:

A Trip From Chicago, McGraw-Hill Films, 1221 Avenue of Americas, New York, N.Y. 10020. Color. 16mm. 25 minutes. Purchase - $325.00, rental - $18.00. Interesting bit of science futurism. Offers some engaging predictions of what transportation will be like in the year 2000. Concentrates on high speed trains, aircraft and water vessels. Grades 1-8.

PAMPHLETS:

A Master Plan for Transportation, N. J. Department of Transportation, 1035 Parkway Avenue, Trenton, N. J. 08625. 1972. Free in single copies to New Jersey residents. Summary of transportation needs and an overview of transportation problems and the difficulties of establishing a model for the state. Many multicolored graphs, charts and maps. Grades 6, 7, 8.

Transportation - Facts and Trends, Transportation Association of America, 1101 17th St., NW, Washington, D.C. 20036. 1973. $10.00. This publication is the result of an annual effort of the Transportation Association of America to summarize the importance of transportation in America. Uses latest statistical data.

KIT:

Transportation, ABT Association, Inc. 1974. Games Central, 55 H Wheeler St., Cambridge, Mass. 02138. This simulation game is for 8 to 34 plays. The object of the game is to plan and take economical and fast trips using different kinds of transportation. Players must use basic mathematical concepts to calculate their moves and solve transportation problems of graded complexity. Grades 6, 7, 8.